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REPORT

CD NO.

LANGUAGE Russian

DATE OF INFORMATION 1950

DATE DIST. 15 May 1950

NO. OF PAGES 3

SUPPLEMENT TO
REPORT NO.

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SOURCE Rechnoy Transport.

SHIP LINES HAVE VARYING OPINIONS ON ZD-6 ENGINE

OUTLINES ENGINE'S DRAWBACKS -- Rechnoy Transport, 28 Oct 49

The ZD-6 engine is a high-speed Diesel engine introduced relatively recently in river transport. It first appeared on the Don River in 1948 in small Diesel towing ships. Its complex design, the impossibility of making on-the-spot repairs, the restrictions in the types of oil and fuel which it can use, its noisiness, and other factors, have been given as reasons for stating that it is not suitable for river transport. However, many of the defects can be explained by the fact that operating personnel are unacquainted with the engine.

NEMAN SHIP LINE REPORTS SUCCESS WITH ZD-6 -- Rechnoy Transport, 2 Dec 49

The experience of ship crews of the Neman Ship Line with the ZD-6 Diesel engine deserves the widest distribution, not only among ships of the Main Administration of River Transport of Southern Regions, but throughout river transport. By increasing the length of service of the engines the Neman Ship Line is achieving savings of 15,000 rubles per engine per year, and the space used for engine repair is freed. At present, there are dozens of ZD-6 engines being used in the ship line, and their number will be doubled in the near future. Repair of the engines will be done in the Plant imeni Stalin in Kiev, the "Krasnyy flot" Plant in Rostov, and in the Kaunas and Gomel' plants.

Rechnoy Transport, 13 Dec 49

At the end of 1947 the Neman Ship Line received the first shipment of domestically produced high-speed ZD-6 Diesel engines. The manufacturing plant guaranteed a 1,000-hour operating period. Since there were no experienced Diesel engine operators in the southern river basins, teams were made up to study the engine and operate it according to factory instructions. The inexperience of operating personnel caused some motors to get out of

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After a comparatively short time, the relays, batteries, etc., got out of order often. However, at the end of the 1948 navigation season the engine operators had gained some experience in handling the engines and changed their former opinion of them.

On the ship Michurin the engine has already run for 4,400 hours, and inspection has shown that the engine has no visible defects. The exhaust and number of revolutions are normal, there is no overexpenditure of fuel or lubricants, and the oil pressure, which measures the condition of the bearings, is 8.5 atmospheres. The exhaustion of air in the gear case, which measures the condition of the piston groups, at first was 15 millimeters of water glass, and is now less than 6 millimeters. It must be remembered that for engines just produced by a plant, there is a pressure allowance of plus or minus 20 millimeters.

The engines were installed in the ships strictly according to factory instructions, that is, centered with the propeller shafts, on three supports without using rubber cushioning. The temperature and lubricating oil are kept at 85-90 degrees Celsius. Some ships equipped with ZD-6 engines are being equipped with centralized control from the wheelhouse.

LINE BLAMES 1949 FAILURES ON ZD-6 -- Rechnoy Transport, No 12, 10 Feb 50

One of the shortcomings in the operation of the Don Ship Line during 1949 was that it had not yet mastered fully the operation of Diesel ships equipped with ZD-6 engines. During the navigation period ships of this type spent considerable time in repair. The lack of spare engines made the unsatisfactory performance worse. The majority of the ships did not fulfill their obligations.

DISCUSSES INCREASE IN EFFICIENCY OF ZD-6 -- Rechnoy Transport, No 22, 17 Mar 50

The editors of Rechnoy Transport have received much material on the question of the more efficient utilization of the ZD-6 Diesel engine.

In the Dnepr Ship Line ZD-6 engines installed in various ships had, at the end of the 1949 navigation season, operated for 3,208 to 5,559 hours. One method, suggested by ship's engineer Buzykin, of improving the engine's operation was "fresh-water cooling" (in a closed system), in which cooling is done with the engine's radiator suspended over the side of the ship in the water. The day is not far off when the Dnepr river workers will be able to suggest to the plant which makes the engines that the fresh-water pump be removed from the engines.

On the Don River, some workers, to remove the sludge and deposit from the oil which are deposited in the crankshaft journals because of the design of the crankshaft of the engine, have adopted a method of cleaning in which hot Diesel oil is poured from the service tank into the motor. Enough oil is poured through the blower into the crankcase to surround the crankshaft bearings. The motor is started and worked at slow speed for 3-5 minutes, after which the lower drainage plug is opened and the dirty oil allowed to run out. This operation is repeated two or three times. Thus the oil lines and crankcase are well cleaned. The Diesel oil, after filtering, can be used again.

Another method of cleaning the combustion chambers and the gears is pouring kerosene into the combustion chamber through the jet apertures while the engine is warm. After 8-10 hours the coke is removed and the compression of the engine is restored.

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On the Diesel ship Michurin allowances are made for the extreme sensitivity of the ZD-6 engine to the quality of fuel and lubricants, and the oil filters are not cleaned every 100 hours, as recommended by the instructions, but every 50 hours.

On the Moscow-Volga Canal, performance of the ZD-6 engines is improved by introducing new packing in place of the pressed graphite packing, by installing small tanks to improve the first revolutions of the engines, by lightening the packing of the circulation pumps with grease, and by improving the exhaust system, which measure permitted raising the number of revolutions of the engine by 70-80 per minute.

The head of the Diesel shop of the Kiev Plant imeni Stalin, which does repair of the ZD-6 engines, reports that not everywhere is the necessary attention given to the operation of the engines. Engines sent to the plant for repair from the Northern Ship Line have broken crankshafts with traces of twisting, which is explained by the fact that on rivers where free floating of timber is still done, foreign objects get into the propellers, jamming them and twisting them when the engine is turning at the maximum number of revolutions. It is recommended that the same methods of bracing the propeller shaft be used in the north as are employed on the Dnepr: either installing a cast-iron flange on the propeller shaft or trimming the connection bolts in the danger area, so that with a sudden increase in load either the flange or the bolts will break and the crankshaft will be saved.

The plant has discovered cracks in the lower casings of Diesel engines arriving from Vologda. The reason for these cracks is thought to be insufficient fastening of the engines and vibration of the engine on the foundation while in operation.

An engineer-designer of the Central Planning and Design Bureau of the Ministry of River Fleet proposed that there be organized in the bureau a technical aid group with the functions of helping river workers with problems of operation and repair of the ZD-6 engines and handling all questions concerning these matters. The Ministry of River Fleet would prohibit any alteration in ships and engines, concentrating all matters in the Central Planning and Design Bureau, which alone would have the right to make adjustments and would render technical assistance to improve technical operation and repair of the engines.

The Central Scientific Research Institute of River Fleet has done research on the conversion of the ZD-6 engine to generator gas. The conversion was done on a gas-liquid cycle. The compression ratio was not changed. The fuel equipment, the connection of the rate regulator with fuel pumps, and the hand-operated liquid fuel delivery control were left without any changes. The air-intake manifold was divided into three parts and used to collect the gas mixture. Tests have indicated that the gas distribution and angle of advance of the delivery of liquid fuel have to be changed. The tolerance gap between the back of the head of the jaw plate of the intake valves and the clamp plate of the coupling rod valve was increased from 2.34 millimeters to 4.08 millimeters; this increase retarded the opening of the intake valve by 20 degrees, and the full angle of intake was reduced from 248 degrees to 208 degrees. The gas generator was tested on coal semicoke and anthracite. The results of the tests and the conclusions of the commission adopting the ZD-6 engine converted to gas permit the recommendation of the gas generator for introduction on gas-powered ships of the river fleet.

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